

REMARKS

The claims have been amended to more clearly define the invention as disclosed in the written description. In particular, claim 10 has been amended to correct typographical errors.

Applicant believes that the above changes answer the Examiner's 35 U.S.C. 112, paragraph 2, rejection of claim 10, and respectfully requests withdrawal thereof.

The Examiner has rejected claims 5, 6, 8 and 9 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,067,360 to Kasai et al. The Examiner has further rejected claim 7 under 35 U.S.C. 103(a) as being unpatentable over Kasai et al. in view of U.S. patent 5,412,732 to Kanishi et al.

The Kasai et al. patent discloses an apparatus for localizing a sound image and a method for localizing the same, in which front left and right sound signals and surround left and right sound signals are processed and applied to a single pair of loudspeakers 4L/4R such that the sound generated by these two loudspeakers 4L/4R give the listener 2 the impression that, in addition to the sound images emanating directly from these two loudspeakers 4L/4R, left and right surround sounds are emanating from virtual surround speakers XL/XR positioned to the left and right of the listener, and widened left and right signals are emanating from virtual loudspeakers XXL/XXR positioned wider than loudspeakers 4L/4R. As such, the Kasai et al. apparatus enables a

listener to appreciate surround sound and widely spaced front speakers without having to actually purchase and position the actual additional loudspeakers. (It should be understood that one of the basic complaints against multi-speaker systems is the difficulty of integrating these additional boxes in the decorating scheme of a room.)

The Examiner now states "It is well known in the art to connect loudspeakers, such as left and right rear loudspeakers directly to the input left and right rear sound signals provided as shown in Fosgate (U.S. Patent No. 5199075) for example (Fig. 1), which is one of many prior arts that discloses loudspeakers directly connected to inputted left and right rear sound signals. Therefore it would have been obvious to one skilled in the art to also provide the input left and right rear sound signals (SL, SR) directly to left and right rear loudspeakers provided, in which a portion of multi-media users will already possess, or will buy a 4 (or more) loudspeakers configuration to cater for alternative formats, such as Dolby Digital."

Applicant submits that it appears from the above that the Examiner is equating left and right surround signals/sounds with left and right rear signals/sounds. In fact, these are actually four different signals/sounds. In particular, Kasai et al. specifically indicates that the input signals to the apparatus are front left/right signals FL and FR, and surround left/right signals

SL and SR. These surround signals are not meant to be applied to rear loudspeakers, but rather to surround loudspeakers located laterally of the listener. This is support in the Fosgate patent cited by the Examiner in which left/right side (surround) signals LS/RS are directed to loudspeakers radiating laterally to the listening area, while left/right back (rear) signals LB/RB are directed to loudspeakers radiating toward the back (rear) of the listening area.

The Kasai et al. apparatus takes input left/right front signals and input left/right surround (i.e., side) signals (which ordinarily would be applied to left/right surround speakers located to the sides of the listener) to generate output left/right front signals which, when applied to real left/right front loudspeakers, generates sound signals which appear to emanate from virtual left/right surround (side) loudspeakers XL/XR located to the left/right sides of the listener, as well as sound signals which appear to emanate from virtual left/right front loudspeakers XXL/XXR positioned in front of the listener and wider than the real left/right front loudspeakers 4L/4R. It should be noted that Kasai et al. neither discloses nor suggests receiving and processing input left/right rear signals.

The subject invention, on the other hand, processes input left and right front sound signals along with input left and right rear sound signals, to generate signals for left and right front

speakers, along with the input left and right rear sound signals for left and right rear speakers, so that the sound signals from the left and right front speakers additionally produce virtual surround speakers to the left and right of the listener. It should be understood that the system of the subject invention does not receive input left/right surround signals, but rather, left/right rear signals.

With regard to claim 5, the Examiner states "Kasai as modified does not expressly disclose generating means comprises a low-pass filter for filtering the left and right rear sound signals. However it would have been obvious to one having ordinary skill in the art to provide a low-pass filter for the left and right rear sound signals in order to filter out high frequencies, therefore providing a desired frequency range."

Applicant submits that the Examiner is reading something into the claim that is not there, i.e., the low-pass filter is included to provide a desired frequency range. In fact, there is nothing in the specification or claims that indicate that the low-pass filter is inserted merely to provide a desired frequency range. The only assumption that one can make is that the addition of the low-pass filters somehow enhances the effects of the system.

Further, the only filters shown in Kasai et al. are the filters 12SUM and 12 DIF which appear in the means 12 for localizing the sound image to the sideward of the listener, and are

"(so called shuffler type filters)" (col. 5, lines 22-25). However, these filters do not filter the left and right rear sound signals. Rather, these filters filter a sum of the signals $((FL + SL) + (FR + SR))$, on the one hand, and a difference of the signals $((FL + SL) - (FR + SR))$.

With regard to claim 6, the Examiner states "However, it would have been obvious to one having ordinary skill in the art to provide a delay for the left and right rear sound signals in order to compensate for the delay caused by the filter (12), as applied to the other sound signals (Figs. 1, 5, 7, and 8; column 5, lines 31-47; column 6, lines 57-60)."

Applicant submits that what the Examiner is saying does not make any sense. Assuming that the left/right surround signals applied in Kasai et al. are left/right rear signals, if one were to insert delays to compensate for the filters in 12, these delays would correspond to the delay means 14L/14R show in Fig. 1 as applied to the left/right front signals. If one were to additionally delay the input left and right surround signals, this would not compensate for filters in 12, but would add to any delay in the filters in 12.

Applicant stresses that in the subject invention, as claimed in claim 6, the generating means comprises delay circuits for delaying the left and right rear sound signals. One can only presume that the generating means requires these delay circuits in

order to properly generate the left and right virtual sound signals.


The Kanishi et al. patent discloses a stereo surround system in which a stereo signal (Left and Right signals) is processed to form left and right lower sound signals and left and right upper sound signals for application to 4 respective loudspeakers (see, e.g., Fig. 6), and alternatively processed to additional form rear left and right lower sound signals and left and right upper sound signals for application to 4 additional rear loudspeakers (see, e.g., Fig. 15). With regard to the embodiment shown in Fig. 6, Kanishi et al. discloses that a known reverberation sound generation circuit may be employed.

However, Applicant submits that Kanishi et al. does not supply that which is missing from Kasai et al., i.e., processing input left and right front sound signals along with input left and right rear sound signals, to generate signals for left and right front speakers, along with the input left and right rear sound signals for left and right rear speakers, so that the sound signals from the left and right front speakers produce virtual surround speakers to the left and right sides of the listener.

In view of the above, Applicant believes that the subject invention, as claimed, is not rendered obvious by the prior art, either individually or collectively, and as such, is patentable thereover.

Applicant believes that this application, containing claims 5-10, is now in condition for allowance and such action is respectfully requested.

Respectfully submitted,

by 
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